

ISL6296A

FlexiHash™ For Battery Authentication

FN6567  
Rev.7.00  
July 8, 2016

The [ISL6296A](#) is a highly cost-effective fixed-secret hash engine based on Intersil's FlexiHash™ technology. The device's authentication is achieved through a challenge response scheme, which is customized for low-cost applications where cloning via eavesdropping without knowledge of the device's secret code is not economically viable. When used for its intended applications, the ISL6296A offers the same level of effectiveness as other significantly more expensive high maintenance monetary-grade hash algorithm and authentication schemes.

The ISL6296A has a wide operating voltage range and is suitable for direct powering from a 1-cell Li-ion/Li-Poly or a 3-cell series NiMH battery pack. The ISL6296A can also be powered by the XSD bus when the bus pull-up voltage is 3.3V or higher. The device connects directly to the cell terminals of a battery pack and includes on-chip voltage regulation circuit, POR and a noncrystal based oscillator for bus timing reference.

Communication with the host is achieved through a single-wire XSD interface (a light-weight subset of Intersil's ISD bus interface). The XSD bus is compatible for use with serial ports offered by all 8250 compatible UARTs or a single GPIO (General Purpose Input and Output) pin of a microprocessor.

A clone prevention solution utilizing the ISL6296A offers safety and revenue protection at the lowest cost and power and is suitable for protection against after-market replacement for a wide variety of low-cost applications.

**Related Literature**

- [AN1167](#), "Implementing XSD Host Using a GPIO"
- AN1166, "FlexiHash Engine Algorithm"

**Features**

- Challenge-response based authentication scheme using 32-bit challenge code and 8-bit authentication code
- Fast and flexible authentication process. Multipass authentication can be used to achieve the highest security level if necessary
- 16x8 OTP ROM stores up to three sets of 32-bit host selectable secrets with additional programmable memory for storage of up to 48 bits of ID code and/or pack information
- FlexiHash engine uses two sets of 32-bit secrets for authentication code generation
- Nonunique mapping of the secret key to an 8-bit authentication code maximizes hacking difficulty due to need for exhaustive key search (superior to SHA-1)
- Supports 1-cell Li-ion/Li-Poly and 3-cell series NiMH battery packs (2.6V ~ 4.8V operation), or powered by the XSD bus
- XSD single-wire host bus interface communicates with all 8250-compatible UARTs or a single GPIO. Supports CRC on read data and transfer bit-rate 5.78kbps
- True "Zero Power" sleep mode - automatically entered after a bus inactivity time-out period
- 5 Ld SOT-23, 8 Ld TDFN and 8 Ld μTQFN packages
- -25°C to +85°C operating temperature range
- Pb-free (RoHS compliant)

**Applications**

- Battery pack authentication
- Printer cartridges
- Add-on accessories
- Other nonmonetary authentication applications

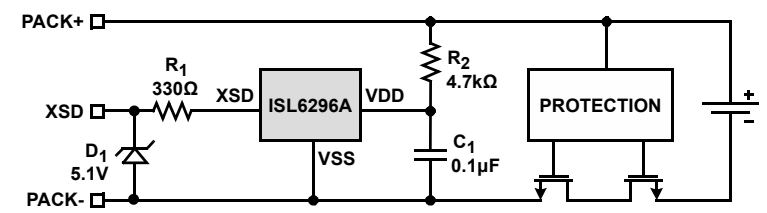


FIGURE 1. TYPICAL APPLICATION WITH THE ISL6296A POWERED BY THE BATTERY

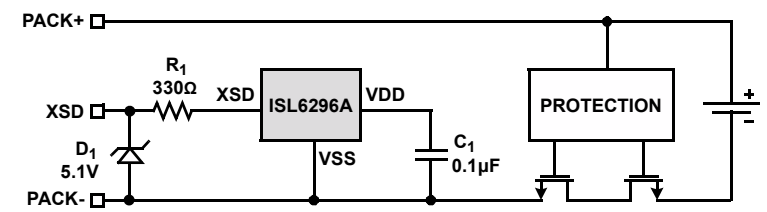


FIGURE 2. TYPICAL APPLICATION WITH THE ISL6296A POWERED BY THE XSD BUS

**© Copyright Intersil Americas LLC 2007-2016. All Rights Reserved.  
All trademarks and registered trademarks are the property of their respective owners.**

For additional products, see [www.intersil.com/en/products.html](http://www.intersil.com/en/products.html)

---

Intersil products are manufactured, assembled and tested utilizing ISO9001 quality systems as noted in the quality certifications found at [www.intersil.com/en/support/qualandreliability.html](http://www.intersil.com/en/support/qualandreliability.html)

---

*Intersil products are sold by description only. Intersil may modify the circuit design and/or specifications of products at any time without notice, provided that such modification does not, in Intersil's sole judgment, affect the form, fit or function of the product. Accordingly, the reader is cautioned to verify that datasheets are current before placing orders. Information furnished by Intersil is believed to be accurate and reliable. However, no responsibility is assumed by Intersil or its subsidiaries for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Intersil or its subsidiaries.*

---

For information regarding Intersil Corporation and its products, see [www.intersil.com](http://www.intersil.com)